PUMPKIN (*Cucurbita pepo* 'Half Pint')
    Phytophthora blight; *Phytophthora capsici*

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Efficacy of Biofence for managing Phytophthora blight in cucurbits, 2017.

An experiment with field-grown pumpkins was conducted at the Long Island Horticultural Research and Extension Center (LIHREC) in Riverhead, NY, in a field with Haven loam soil. The objective was to evaluate the soil amendment product Biofence for the control of Phytophthora blight on pumpkins compared to biopesticides. Biofence is an organic fertilizer made from a specially bred brassica crop high in glucosinolate. The field was chosen because it has a history of Phytophthora blight. *Phytophthora capsici* proliferation was encouraged the previous season by growing squash and pumpkin throughout the field with no management practices for Phytophthora blight. The field was plowed on 25 Jun. Biofence (6-2-0) was applied on 28 Jun to the appropriate plots at 2000 lb/A providing 101 lb/A N. At the same time controlled-release fertilizer (N-P-K, 15-5-15) was applied at 675 lb/A to the other plots. Pumpkins were planted with a vacuum seeder at approximately 24-in plant spacing on 7 Jul. Strategy 3 pt/A, Sandea 0.5 oz/A and Roundup PowerMax 22 oz/A were applied prior to seedling emergence for weed control on 7 Jul using a tractor mounted sprayer. During the season, weeds were controlled by cultivating and hand weeding as needed. Moisture was initially provided by overhead irrigation; drip line was laid on 17 Jul and used for the rest of the season. Plots were two 10-ft rows spaced 68 in. apart. The 20-ft area between plots was also planted to pumpkin. A randomized complete block design with four replications was used. All plots received the following fungicide applications to control powdery mildew, Vivando 15 fl oz/A on 7 Aug, Torino 3.4 fl oz/A on 14 Aug, Procure 8 fl oz/A on 21 Aug, and Vivando 15 fl oz/A on 28 Aug. Four applications of biopesticides were made to soil with one before planting, one pre-emergence, and two while plants were small. Foliar applications for Phytophthora blight were made five times on a 7-day preventive schedule beginning on 3 Aug. All nine were made using a tractor-mounted boom sprayer equipped with twinjet (TJ60-11004VS) nozzles spaced 17 in. apart that delivered 72 gal/A at 50 psi and 2.3 mph. Plots were evaluated for Phytophthora fruit rot symptoms on 24, 28, and 31 Aug. At each assessment, all fruit within the plot were inspected for rot and recorded as a percentage of the total fruit. Average monthly high and low temperatures (^{o}F) were 83/69 in Jul, 81/66 in Aug, and 77/64 in Sep. Rainfall (in.) was 3.45, 4.95, and 3.00 for these months, respectively.

An intensive rainstorm on 18 Aug with 3.28 in. rain likely provided favorable conditions for Phytophthora blight. Symptoms were first observed in this experiment on 24 Aug. The Biofence soil amendment as well as the rotation treatment of biopesticides failed to significantly reduce the incidence of Phytophthora blight compared to the untreated control. Disease pressure was high but distribution throughout the field was highly variable. Effective control was achieved with conventional fungicides in an adjacent experiment with the same cultivar.

Treatment and rate/A (application dates) [z]	Application target	Affected fruit (%) [y,x]
Untreated control	--	59.6
Biofence 2000 lb	soil	60.0
Bio-Tam 4 lbs + Taegro 4 oz (1,3),	soil	
SoilGard 12G 10 lbs (2,4),	soil	
Actinovate AG 12 oz (5,7,9),	plant	
Regalia 3 qt (5-9),	plant	
Double Nickel 1.5 lb + Cueva 2 qt (6,8)	plant	46.8
P-value (treatment)		0.7938

[z] Rate of formulated product/A. Soil-directed application dates were 1=29 Jun, 2=13 Jul, 3=20 Jul, and 4=27 Jul. Foliar application dates were 5=3 Aug, 6=11 Aug, 7= 17 Aug, 8=25 Aug, and 9=1 Sep.

[y] Numbers in each column with a letter in common are not significantly different from each other (Tukey's HSD, *P*=0.05).

[x] Values were square root transformed before analysis because raw data were not distributed normally. Table contains de-transformed values.